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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/826,198

04/15/2004

Symon Brewer

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04/25/2005

THE LAW OFFICES OF MIKIO ISHIMARU
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EXAMINER

WONG, LINDA

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action SummaryApplication No. **10/826,198**

Applicant(s)

BREWER, SYMON

Examiner

Linda Wong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 15 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because written labels for components of the invention are needed to clarify the drawings. For example, label 218 should have a written term "Dither Unit" along with the numerical number.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelkar et al. (US Patent No.: 5663991) in view of Yanagisawa et al. (US Patent No.: 6528982).

- a. **Claim 1**, Kelkar et al discloses an inputting signal to generate signal transition locations (Fig. 5, labels 84 and 83), latching or sorting the transition location using a sampling clock signal (Col. 3, lines 42-44), converting the signal transition to a delay value (Col. 3, 45-53). Although Kelkar et al does not disclose converting the delay value to an edge position and detecting a value of the edge position, Yanagisawa et al discloses an edge detector converts the first and second signal into first and second timing signals, a comparison pulse generator that outputs the phase difference or delay value of the first and second timing signals. (Fig. 7, labels 107 and 103) It would be obvious to one skilled in the art to combine Kelkar et al's invention with Yanagisawa et al to produce multiple delays of the input signal to make the jitter between the signals easily detectable. (Abstract of Yanagisawa et al, lines 2-3)
 - b. **Claim 4**, Yanagisawa et al discloses a comparator comparing the phase different or edge movement exceeding a predetermined value. (Abstract, lines 9-12)
3. **Claims 2, 5-7, 9-12, 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelkar et al (US Patent No.: 5663991) in view of Yanagisawa et al. (US Patent No.: 6528982) and further in view of Sunter et al. (US Application No.: 20050069031).
- a. **Claim 2**, Although neither Kelkar et al nor Yanagisawa et al discloses a filter, Sunter et al. discloses a jitter reducing system comprising a filter after detecting

- a phase error and before the analysis circuit. (Fig. 6B, label filter) It would be obvious to one skilled in the art to include a filter in a system for reduction of jitter to filter out high frequencies. (Col. 15, lines 26-28)
- b. **Claim 5**, Although neither Kelkar et al nor Yanagisawa et al discloses the calculation of the root mean square of the edge position output, Sunter et al inherently discloses the calculation of the root mean square by measuring a statistical value of the output data computed by the analysis circuitry. (page 2, paragraph [0017] and Fig. 6A, label 22) It would be obvious to one skilled in the art to include an analysis circuitry to provide a "simpler, lower cost technique that accurately measures jitter." (Page 2, paragraph [0015])
- c. **Claim 6** inherits all the limitations of Claim 1. Although neither Kelkar et al and Yanagisawa et al discloses a peak-to-peak detection and output, Sunter et al discloses an analysis circuitry measuring and outputting the peak-to-peak value of the latched output data signal. (Fig. 3, label 22) It would be obvious to one skilled in the art to include an analysis circuitry to provide a "simpler, lower cost technique that accurately measures jitter." (Page 2, paragraph [0015])
- d. **Claim 7** inherits all the limitations of claim 2.
- e. **Claim 9** inherits all the limitations of claim 4.
- f. **Claim 10** inherits all the limitations of claim 5.
- g. **Claim 11**, Kelkar et al discloses a tapped delay line (Fig. 2, labels 33, 35, 37, 39), a sampling clock or a measured clock (Fig. 2, label 26), a sample register for latching the signal transitions. (Fig. 2, labels 36, 38, 40, 42) Although

Kelkar et al does not teach a priority encoder, and converter, Yanagisawa et al discloses an encoder in the form of a comparator detecting the phase difference or delay value and a converter in the form of a periodic signal generator outputting a signal for each width or delay value or phase difference. (Fig. 1, labels 103, 104) It would be obvious to one skilled in the art to combine Kelkar et al's invention with Yanagisawa et al to produce multiple delays of the input signal to make the jitter between the signals easily detectable. (Abstract of Yanagisawa et al, lines 2-3) Although neither Kelkar et al nor Yanagisawa et al discloses a peak-to-peak detector, Sunter et al discloses an analysis circuit that calculates the peak-to-peak value of the latched signal. (Fig. 6A, label 22) It would be obvious to one skilled in the art to include an analysis circuitry to provide a "simpler, lower cost technique that accurately measures jitter." (Page 2, paragraph [0015])

- h. **Claim 12** inherits all the limitations of claim 2.
 - i. **Claim 14** inherits all the limitations of claim 4.
 - j. **Claim 15** inherits all the limitations of claim 5.
4. **Claims 16-17, 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelkar et al (US Patent No.: 5663991) in view of Yanagisawa et al. (US Patent No.: 6528982) further in view of Sunter et al. (US Application No.: 20050069031) and further in view of IEEE Design and Test of Computers, "FPGA and CPLD Architectures: A Tutorial".

- a. **Claim 16** inherits all the limitations of claim 11. Although a field programmable gate array carry chain (FPGA carry chain) is not disclosed by Kelkar et al, Yanagisawa et al and Sunter et al, based on the tutorial provided by IEEE Design and Test of Computers, "FPGA and CPLD Architectures: A Tutorial", an FPGA is a programmable array of flip-flops or logic gates. Kelkar et al discloses a variable delay line, which is equivalent to an FPGA. (Fig. 5, label 83) It would be obvious to one skilled in the art to provide an FPGA carry chain comprised of a interchanging or programmable delay line to provide a more robust, dynamic array of logics to decrease cost and provide very high pin-to-pin speed performance. (Definitions: page 43 under Terminology, pg 43, Col. 3, line 4 and pg 44, Col. 1, lines 1-2)
 - b. **Claim 17** inherits all the limitations of claim 2.
 - c. **Claim 19** inherits all the limitations of claim 4.
 - d. **Claim 20** inherits all the limitations of claim 5.
5. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelkar et al. (US Patent No.: 5663991) in view of Yanagisawa et al. (US Patent No.: 6528982) and further in view of Suzuki (US Patent No.: 6782353).
- a. **Claim 3**, Although neither Kelkar et al nor Yanagisawa et al discloses a dither unit, Suzuki discloses an OR circuit adding the delay signal outputted by the delay circuit to the data signal. (Fig. 11, labels 12b, 12a and Col. 2, lines 6-16)

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It would be obvious to one skilled in the art to delay the signal so as to correctly carry out measurements of an error ratio or jitter. (Abstract, lines 4-5)

6. **Claims 8, 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelkar et al (US Patent No.: 5663991) in view of Yanagisawa et al. (US Patent No.: 6528982) further in view of Sunter et al. (US Application No.: 20050069031) and further in view of Suzuki (US Patent No.: 6782353).
 - a. **Claims 8, 13** inherit the limitations of claim 3.
7. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelkar et al (US Patent No.: 5663991) in view of Yanagisawa et al. (US Patent No.: 6528982) further in view of Sunter et al. (US Application No.: 20050069031) further in view of IEEE Design and Test of Computers, "FPGA and CPLD Architectures: A Tutorial" and further in view of Suzuki (US Patent No.: 6782353).
 - a. **Claim 18** inherits the limitations of claim 3.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linda Wong whose telephone number is 571-272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LW



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